

Application No.: 10/759,113

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MAR 15 2007

Amendments to the Drawings:

Fig. 5B has been amended to properly illustrate the location of the electrolyte sealing portions 21. The amendment is shown in the attached Replacement Sheet.

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CENTRAL FAX CENTER****MAR 15 2007****Application No.: 10/759,113****REMARKS**

This Amendment is being filed in response to the Office Action mailed December 15, 2006. For the following reasons this application should be allowed and the case passed to issue. No new matter is introduced by this amendment. Support for the amendments to claims 1, 19, and 20 is found in originally filed claims 4 and 6. Claims 17 and 18 are amended to correct informalities. Claims 7 and 10 are amended to correct dependency.

Claims 1-3, 5, and 6-20 are pending in this application. Claims 1-5 and 13-20 have been rejected. Claims 6-12 are objected to. Claims 1, 7, 10, and 17-20 have been amended in this response. Claims 4 and 6 have been canceled in this response.

Objection to the Drawings

The drawings were objected to because reference nos. 3 and 21 were both used to designate the negative electrode in Fig. 5B. This objection is traversed, and reconsideration and withdrawal thereof respectfully requested.

Fig. 5B has been amended, as in the attached Replacement Sheet, to correct the noted informality. As is clear from amended Fig. 5B and throughout the present specification, reference no. 21 depicts the electrolyte sealing portions.

Objection to the Specification

The specification is objected to because a foreign application was incorporated by reference. This objection is traversed, and reconsideration and withdrawal thereof respectfully requested.

The specification has been amended to delete the incorporation by reference of the foreign application.

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Objection to the Claims

Claims 17 and 18 were objected to as being of improper dependent form. This objection is traversed, and reconsideration and withdrawal thereof respectfully requested.

Claims 17 and 18 have been amended to correct the noted informalities.

Claim Rejections Under 35 U.S.C. § 101

Claim 18 was rejected under 35 U.S.C. § 101 because the claimed recitation of a use without setting forth any steps involved in the process or features involved in a battery product results in an improper definition of a process or product. This rejection is traversed, and reconsideration and withdrawal thereof respectfully requested.

Claim 18 has been amended to affirmatively recite that the bipolar battery is to be utilized as a power source of a vehicle.

Applicants submit that claim 18 fully comports with the requirements of 35 U.S.C. § 101.

Claim Rejections Under 35 U.S.C. § 112

Claim 18 was rejected under 35 U.S.C. § 112, second paragraph, as being indefinite because the claim does not set forth any steps involved in the method/process/product. This rejection is traversed, and reconsideration and withdrawal thereof respectfully requested.

Claim 18 has been amended to affirmatively recite that the bipolar battery is to be utilized as a power source of a vehicle.

Applicants submit that claim 18 fully comports with the requirements of 35 U.S.C. § 112.

Claim Rejections Under 35 U.S.C. § 102

Claims 1-5 and 17-20 were rejected under 35 U.S.C. § 102(b) as being anticipated by JP 59-128776 A (JP '776). This rejection is traversed, and reconsideration and withdrawal thereof

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respectfully requested. The following is a comparison between the present invention, as claimed, and the cited prior art.

An aspect of the invention, per claim 1, is a bipolar battery comprising a plurality of bipolar electrodes. Each of the plurality of bipolar electrodes is provided with a current-collector; a positive electrode layer formed on one side of the current-collector; and a negative electrode layer formed on the other surface of the current-collector. Electrolyte layers are formed between adjacent ones of the plurality of bipolar electrodes, respectively, so that the plurality of bipolar electrodes are stacked in the stacking direction by interposing the electrolyte layers between adjacent ones of the plurality of bipolar electrodes, respectively. Sealing portions surround and seal the electrolyte layers, respectively. The contributing members contribute to keeping gaps between the adjacent ones of the plurality of bipolar electrodes. The bipolar battery is a lithium-ion secondary battery and the contributing members are disposed within the areas of the sealing portions to be discrete spacers or continuous spacers having the heights in the stacking direction so as to spread between the adjacent ones of the plurality of bipolar electrodes, respectively.

Due to the specific structure of the present invention, there can be provided a highly reliable bipolar lithium-ion secondary battery including unit cells series connected within the battery, capable of forming electrolyte sealing portions while keeping gaps between current collector foils, thereby enabling the electrolyte sealing portions to electrically insulate the electrodes from each other.

JP '776, however, is directed to a molten salt battery. JP '776 does not disclose a lithium-ion secondary battery or method of manufacturing a bipolar battery comprising contributing members or means contributing to keeping gaps between the adjacent ones of the

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plurality of bipolar electrodes, the contributing members or means being disposed within areas of the sealing portions to be discrete spacers or continuous spacers having heights in the stacking direction so as to spread between adjacent ones of the plurality of bipolar electrodes, respectively, as required by claims 1, 19, or 20.

Claims 1 and 17-20 were rejected under 35 U.S.C. § 102(b) as being anticipated by JP 11-121025 (JP '025). This rejection is traversed, and reconsideration and withdrawal thereof respectfully requested. The following is a comparison between the present invention, as claimed, and the cited prior art.

JP '025 discloses a secondary battery having electrode elements formed with electron transmitting plates 1, 1' and 1" each of which is attached with positive electrode material and opposing negative electrode material. Specifically, the spacers 4 are disposed between the electron transmitting plates 1 and 1' and between the electron transmitting plates 1 and 1". However, in JP '025, the sealing material is filled with the space 7 disposed outside each spacer 4. JP '025 is silent as to the contributing members or means disposed within the areas of the sealing portions, as required by claims 1, 19, or 20. Thus, JP '025 does not disclose a lithium-ion secondary battery or method of manufacturing a bipolar battery comprising contributing members or means contributing to keeping gaps between the adjacent ones of the plurality of bipolar electrodes, the contributing members or means being disposed within areas of the sealing portions to be discrete spacers or continuous spacers having heights in the stacking direction so as to spread between adjacent ones of the plurality of bipolar electrodes, respectively, as required by claims 1, 19, or 20.

Claims 1, 13, 14, and 16-20 were rejected under 35 U.S.C. § 102(b) as being anticipated by JP 08-007926 (JP '926). This rejection is traversed, and reconsideration and withdrawal

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thereof respectfully requested. The following is a comparison between the present invention, as claimed, and the cited prior art.

JP '926 discloses a nonaqueous electrolyte secondary battery having a collector 1(la, lb) with which negative electrode active material 2 and positive electrode active material 3 are attached opposite to each other. Specifically, the collectors 4 correspondingly facing the collectors 1a and 1b are assembled with the portions 9, while intervening the separators 8 between the collectors 1a and 4 and between the collectors 1b and 4. However, in JP '926 the portions 9 are only designated as insulating portions and these are far from the contributing members keeping the gaps between the adjacent ones of the plurality of bipolar electrodes. Thus, JP '926 does not disclose a lithium-ion secondary battery or method of manufacturing a bipolar battery comprising contributing members or means contributing to keeping gaps between the adjacent ones of the plurality of bipolar electrodes, the contributing members or means being disposed within areas of the sealing portions to be discrete spacers or continuous spacers having heights in the stacking direction so as to spread between adjacent ones of the plurality of bipolar electrodes, respectively, as required by claims 1, 19, or 20.

Applicants further submit that, JP '776, JP '025, and JP '926, whether taken alone, or in combination, do not suggest the bipolar batteries according to claims 1 and 19, and manufacturing method according to claim 20.

Claim Rejections Under 35 U.S.C. § 103

Claim 15 was rejected under 35 U.S.C. § 103(a) as being unpatentable over JP '926 in view of Linden (*Handbook of Batteries*). This rejection is traversed, and reconsideration and withdrawal thereof respectfully requested.

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JP '926 and Linden, whether taken in combination, or alone, do not suggest the bipolar battery according to claim 1. Linden does not cure the deficiencies of JP '926, as Linden does not suggest a lithium-ion secondary battery comprising contributing members contributing to keeping gaps between the adjacent ones of the plurality of bipolar electrodes, the contributing members being disposed within areas of the sealing portions to be discrete spacers or continuous spacers having heights in the stacking direction so as to spread between adjacent ones of the plurality of bipolar electrodes, respectively, as required by claim 1.

Allowable Subject Matter

Claim 6 was objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form.

Applicants gratefully acknowledge the indication of allowable subject matter. In accordance with the Examiner's recommendation, the subject matter of claim 6 has been added to independent claims 1, 19, and 20.

The dependent claims are allowable for at least the same reasons as claim 1, and further distinguish the claimed invention.

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To the extent necessary, a petition for an extension of time under 37 C.F.R. § 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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